

August 18, 2017

**ILRS Quality Control Board (QCB)
Telecon
August 16, 2017**

Next meeting: Wednesday, September 20 at 13:00 UTC, 09:00 EDT, 14:00 in UK; 15:00 in Central Europe; 22:00 in Japan.

Participants: Carey Noll, Erricos C. Pavlis, Matt Wilkinson, Frank Lemoine, Toshi Otsubo, Sean Bruinsma, Alexander Couhert, and Mike Pearlman

Data Systematics Pilot Project (Erricos)

We are still awaiting submission of LAGEOS-1, LAGEOS-2, and LAGEOS-1+LAGEOS-2 solutions with accommodation for the additional wavelength data (Wettzell and ARGO) and agreed conventions. BKG is working on it; it does not look like solutions will be forthcoming from GRGS and ESA. All of these solutions need to be put in the ITRF2014 Reference Frame. The combination of these solutions will be the basis for the operational Station Systematics Data Product. Participation in the product will be a requirement for AC status.

This will require need an education process, some documentation with instructions and more familiarization at the 2017 ILRS Technical Workshop in Riga.

Web-Based Station Performance Tool (Erricos)

QC Report Cards from Mark Torrence on LAGEOS-1 and LAGEOS-2 are now accessible on line at the new QC Reporting Site along with Jason-2 SLR data relative to DORIS+GPS orbits (provided by CNES) and SLR data on GNSS satellites relative to microwave-determined orbits (provided by CODE).

The CODE reports show an SLR offset from the Galileo 201 and 202 orbits at both Yarragadee and Herstmonceux of about 5 - 6 cm. The offset could be satellite center of mass, but this seems rather large. This may not be noticed at other stations due to limited data.

All of the QC results will be filed on a monthly basis for better resolution and comparison. All of the QC files are up to date. The beta version of this tool is ready for testing (<http://geodesy.jcet.umbc.edu/QC/>).

The Web-Based Station Performance Tool will provide users (analysts and missions) with a basis for comparing QC results over time and making standardized reports that can be interpreted by station personnel and augmented with highlights and recommended

actions. Stations may also find these results useful in monitoring data stability over time.

All submissions are now using SLRF2014. A re-analysis of all the SLR data for LAGEOS and LAGEOS-2 is underway.

Site Logs (Carey)

NASA is reviewing all of its site logs for accuracy. David McCormick and several others have drafted an updated site log format to include more historical information and more detail on some areas. Carey will circulate the draft to the CB, the DFPSC, and the NESC for review and comment. Randy Ricklefs will coordinate the review process; a meeting will be held at Riga to try to come to closure.

Range Dependent Errors (NO CHANGE)

Horst has not seen any significant range dependence biases yet, but some structure is apparent. The work will move to the ITRF2014 and Ajisai will be deleted since other more dense satellites are available at the Ajisai altitude. Also at the Etalon level, system noise may be masking any trend information. This will be a topic for discussion in Riga.

Horst will continue working on the range dependent error analysis and present his results in Riga.

Full-Rate Data (NO CHANGE)

We need to define the requirement for FR data on the whole constellation of ILRS satellites; do we need everything? FR volume from the KHz systems could be a burden but if they heed to the 1000-point rule, it should not be a problem. Another topic for Riga.

Tom Varghese will take a look at this and we will decide if we need a study activity,

Normal Point Tests

Horst has been trying to validate that normal point calculations at the station are done in a consistent manner by computing NP's from existing FR data and comparing them with the station provided NP's. Maybe we will get a reading from him in Riga.

Matt has been rewriting and updating the Herstmonceux reduction software in Python to form full-rate and normal point data from raw ranges. The software reads full-rate FRD files or raw epoch-range files and can work with any SLR station. This software could be made available to other stations as an example procedure for comparison with the station's preferred method. Unfortunately not many kHz stations are submitting

full-rate data. Matt has looked at some of the FR data from Changchun, which he said looked tightly clipped.

Erricos suggested looking at historical Jason-2 FR data that were recently delivered by several additional stations in support of the T2L2 experiment for time-synchronization of the ILRS network.

Horst will continue this work and report their results at the DFPSC meeting in Riga.

Low Elevation Data Modeling (NO CHANGE)

Horst is looking at the available low elevation (below 20 degrees) data on LARES to see the influence on station height and pass bias. A few stations (MOBLAS-5, MOBLAS-5, Changchun, Matera, and Graz) can track down to 10 degrees. JCET has cataloged all LAGEOS, LAGEOS-2 and LARES data from 2008 to present and generated annual histograms of the data distribution in elevation, the min and max elevation reached and the pass duration.

Horst will continue working the low elevation data analysis and report at the DFPSC meeting in Riga.

Data Population on LAGEOS and Other Satellite Passes

Some stations submit their data in pass segments and some combine segments into passes. To the analysts, it makes no difference, but it can lead to inconsistencies in the formulation of data yield. Carey has sent out a message to the stations asking about their data submission procedure; She is tabulating the results received so far for the data submission procedure questions.

Has the Changchun Station improved its coverage on LAGEOS?

The ILRS has formed a Study Group to recommend new criteria for evaluating (and rewarding) station performance than just pass numbers and estimated biases. Mark Torrence is the Study Group lead. Toshi has forwarded to the group his charts on station performance.

The Study Group will report at Session 1 at the 2017 ILRS Technical Workshop in Riga with a recommendation

We should also look into how much the posted priorities influence that tracking schedules and procedures at the Stations.

We agreed to ask Georg Kirchner if he would lead that effort at Riga workshop.

Station Tools (NO CHANGE)

We need to define tools/procedures/suggestions to help the stations detect system problems on-site, and to address issues when diagnostics are received from the QC process. Matt has started discussion on this within the Networks and Engineering Standing Committee; input from the stations on practices that they use might be useful.

Matt has established the on-line forum tool. It currently has about 70 members. Some messages have already been posted. Take a look.

Other Topics (NO INPUT)

In our 1 mm long-term interest, it probably is a good idea to do a rigorous component-by-component examination of the SLR systems, trying to understand all error sources in measurements. We should discuss this with Ivan Prochazka.

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